Compelling Evidence for Public Health Action to Reduce Salt Intake

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Health care reform remains a point of focus on the U.S. political agenda. Actively debated are fundamental changes to the health care delivery system, which largely focuses on the diagnosis and treatment of existing disease. Prevention of disease, commonly accomplished through public health interventions, appears to be an afterthought, perhaps because the benefits are mistakenly perceived as small and the cost savings delayed.

In this issue of the *Journal*, Bibbins-Domingo and colleagues[1] document a public health intervention designed to reduce dietary salt intake that can have huge benefits. In brief, the authors project that a national effort to reduce daily salt intake by 3 g (1200 mg of sodium) could reduce the annual number of new cases of coronary heart disease (CHD) by 60,000 to 120,000, stroke by 32,000 to 66,000, and myocardial infarction by 54,000 to 99,000 and reduce the annual number of deaths from any cause by 44,000 to 92,000. This intervention could also save 194,000 to 392,000 quality-adjusted life-years and $10 billion to $24 billion in health care costs annually. Even if the intervention reduced salt intake by just 1 g per day, the benefits would still be substantial and would warrant implementation.

One of the most intriguing aspects of this study is the comparison of the health benefits of salt reduction with those of other interventions. Previous studies have documented that salt reduction is an inexpensive, highly effective public health intervention. Bibbins-Domingo and colleagues extend these findings by showing that a population-wide effort to reduce dietary salt in the United States could be as beneficial as interventions aimed at smoking cessation, weight reduction, and the use of drug therapy for people with hypertension or hypercholesterolemia. The results mirror those of a recent study showing that salt reduction might be as effective in preventing death as several other dietary strategies, including those designed to reduce intake of trans fatty acids and increase consumption of fruit and vegetables.[2]

Bibbins-Domingo and colleagues estimated the benefits of reduced salt intake by applying previously published data to a computer-simulation model. This process relies on a plethora of assumptions. With that in mind, it is reassuring that their results are consistent with those of other studies that have estimated the benefits of salt reduction with the use of different models and analytic approaches.[2,3] For instance, Danaei and colleagues likewise projected that reduced salt intake could prevent 102,000 deaths annually.[2]

Another feature of the authors' modeling is a set of linked assumptions — namely, that salt reduction lowers blood pressure and that lowering blood pressure reduces the risk of stroke and CHD. Although evidence of a direct effect of salt reduction on cardiovascular outcomes is preferred, policymakers consider blood pressure to be one of the few surrogate outcomes that is sufficiently robust to guide policy. More direct evidence of a link between salt intake and cardiovascular disease comes from prospective observational studies and the few available trials with clinical outcomes that concern cardiovascular disease.[4,5]

The large potential benefits of reducing salt intake observed by Bibbins-Domingo and colleagues may even represent an underestimate. Salt reduction is associated with reduced blood pressure in children and an attenuated age-related rise in blood pressure in adults. Neither of these benefits was modeled in the present analysis. There is also evidence that salt reduction may reduce the risk of gastric cancer, end-stage kidney disease, left ventricular hypertrophy, congestive heart failure, and osteoporosis.

The findings by Bibbins-Domingo and colleagues support a population-wide reduction in salt intake, but is such a reduction achievable? To answer this question, one first needs to understand current levels of intake. Mean salt intake in the United States is extremely high in most age groups, including children, and is well above the current daily recommended upper limit of 5.8 g (2300 mg of sodium) (Fig. 1).[6] In several age groups, reducing salt intake by 3 g per day would not achieve the recommended upper limit of intake for U.S. adults, much less the goal of

3.8 g (1500 mg of sodium) per day, which applies to 69% of U.S. adults.[7]

In broad terms, there are two complementary strategies that could be used to lower salt intake: a public health approach, in which food manufacturers reduce levels of salt in processed and prepared foods, and an individual approach, which relies on each person to select and prepare foods with little or no salt. Given that approximately 75% of dietary salt comes from processed foods, the individual approach is probably impractical. Since 1969, the United States has implemented several individual-level initiatives targeting sodium reduction, yet per capita salt consumption appears to be increasing or is at best unchanged. A public health approach is needed. A number of countries, including the United Kingdom, Finland, and Ireland, have implemented aggressive public health programs to reduce salt intake. Monitoring efforts to determine the level of success of these programs are ongoing. Concomitantly, several U.S. manufacturers are reducing the salt content of certain foods (e.g., soups, cereals, and breads), but other manufacturers are increasing the salt levels in their products. For example, the addition of salt to poultry, meats, and fish appears to be occurring on a massive scale.

Public health interventions are often controversial. There is a common misperception that only certain people should reduce their salt intake and that for the vast majority of the population salt reduction is unnecessary. The opposite is true. Elevated blood pressure is a huge public health problem. Approximately one third of adults have hypertension, and another third have prehypertension. For adults who reach the age of 50 years, the lifetime risk that hypertension will develop is 90%.[8] Furthermore, the benefits of salt reduction probably extend to children and young adults. Salt reduction in children has been shown to lower blood pressure,[9] and blood pressure is directly associated with the earliest stages of atherosclerotic disease, even at young ages.[10]

The evidence supporting the call to reduce salt intake as a means of preventing cardiovascular disease is compelling. The United States has had a prominent role in funding research on the adverse effects of excess salt intake and in setting dietary recommendations. However, the United States lags behind many countries when it comes to translating this research into policies that achieve meaningful reductions in dietary salt. We hope that the work of Bibbins-Domingo and colleagues and other independent groups[2,3] will persuade policymakers in the United States and elsewhere to swiftly implement public health interventions that result in population-wide reductions in salt intake. As we deliberate health care reform, let us not neglect this inexpensive, yet highly effective public health intervention for the prevention of disease.

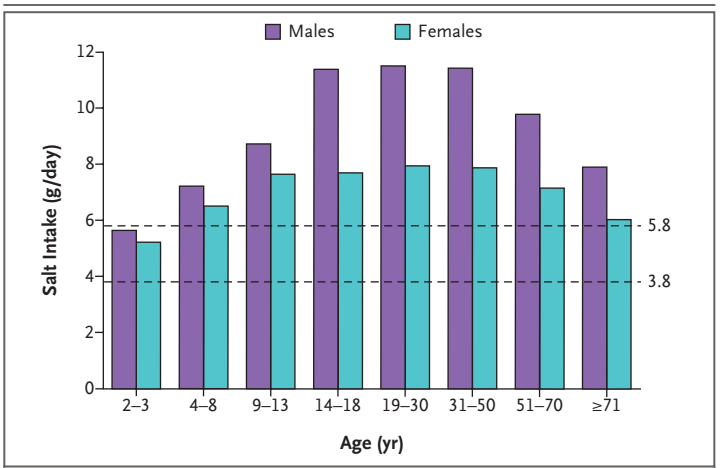

Figure 1. Average Daily Salt Intake in Male and Female Americans, as Ascertained from 24-Hour Dietary Recall, 2005–2006.

In the United States, the recommended upper limit of dietary salt intake for blacks, people with hypertension, and adults older than 40 years of age is 3.8 g per day, whereas the recommended upper limit of salt intake for all other adults is 5.8 g per day. Data are from the U.S. National Health and Nutrition Examination Survey, 2005–2006.[6]

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